

Claims:

1. Process for producing microcapsules with UV filter activity, wherein at least one type of crosslinkable chromophore with UV-A and/or UV-B and/or UV-C filter activity and optionally at least one type of crosslinkable monomer which does not have UV-A and/or UV-B and/or UV-C filter activity are subjected to a crosslinking reaction in the absence of non-crosslinkable chromophores with UV-A and/or UV-B and/or UV-C filter activity.

2. Process for producing microcapsules with UV filter activity according to claim 1, wherein at least one type of crosslinkable chromophores with UV-A and/or UV-B and/or UV-C filter activity and at least one type of crosslinkable monomer which does not have UV-A and/or UV-B and/or UV-C filter activity are subjected to a crosslinking reaction in the absence of non-crosslinkable chromophores with UV-A and/or UV-B and/or UV-C filter activity.

3. Process for producing microcapsules with UV filter activity according to claim 1 or claim 2, wherein the microcapsules are produced by the sol-gel method.

4. Process for producing microcapsules with UV filter activity according to any of claims 1 to 3, wherein the at least one type of crosslinkable chromophore with UV-A and/or UV-B and/or UV-C filter activity is a monomer of the formula $M(R)_n(P)_m(Q)_q$, wherein M is a metallic or semi-metallic element, R is a hydrolysable group, P is a chromophore with UV-A, UV-B and/or UV-C filter activity, Q is a non-hydrolysable group, n is 2 or 3, m is 1 or 2 and q is 0 or 1, wherein $n+m+q=4$.

5. Process for producing microcapsules with UV filter activity according to claim 4, wherein the chromophore P has the general formula $A-(B)_b(C)_c(D)_d(E)_e$ which is chemically bonded to M

wherein

A is a chromophore with UV-A and/or UV-B filter activity and $-(B)_b(C)_c(D)_d(E)_e-$ is a spacer group in which

B is a linear or branched alkylene group with up to 20 carbon atoms

C is O, S or NH

D is a CONH- group

E is a linear or branched alkylene or alkenylene group with up to 20 carbon atoms and

b is 0 or 1,

c is 0 or 1,

d is 0 or 1 and

e is 0 or 1.

6. Process for producing microcapsules with UV filter activity according to claim 4 or 5, wherein the metallic or semi-metallic element M is silicon.

7. Process for producing microcapsules with UV filter activity according to claim 4 or 5, wherein all crosslinkable compounds used for producing the microcapsules are silicon-containing monomers.

8. Process for producing microcapsules with UV filter activity according to any of claims 1 to 7, wherein the at least one type of crosslinkable chromophore with UV-A and/or UV-B and/or UV-C filter activity is a silane monomer comprising at least two C₁₋₆-alkoxy groups.

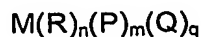
9. Process for producing microcapsules with UV filter activity according to claim 8, wherein all monomers which are used for producing the microcapsules are silane monomers comprising at least two C₁₋₆-alkoxy groups.

10. Process for producing microcapsules with UV filter activity according to any of claims 1 to 9, wherein the microcapsules have a particle size of 0.01-100 µm.

11. Process for producing microcapsules with UV filter activity according to any of claims 1 to 10, wherein the amount of crosslinkable chromophores with UV-A and/or UV-B and/or UV-C filter activity is such that the concentration of UV absorber moieties in the final microcapsule is 10-80 w/w %.

12. Microcapsules with UV filter activity obtainable according to the process of any of claims 1 to 11.

13. Sunscreen composition comprising the microcapsules as defined in claim 12.
14. Use of the microcapsules as defined in claim 12 for producing a sunscreen composition.
15. Crosslinkable chromophore with UV-A and/or UV-B and/or UV-C filter activity which is a monomer of the formula



wherein

- M** is a metallic or semi-metallic element,
- R** is a hydrolysable group,
- Q** is a non-hydrolysable group,
- n** is 2 or 3, **m** is 1 or 2 and **q** is 0 or 1, and wherein $n+m+q=4$ and

P is a chromophore with UV-A, UV-B and/or UV-C filter activity with the general formula $A-(B)_b(C)_c(D)_d(E)_e-$ which is chemically bonded to **M**

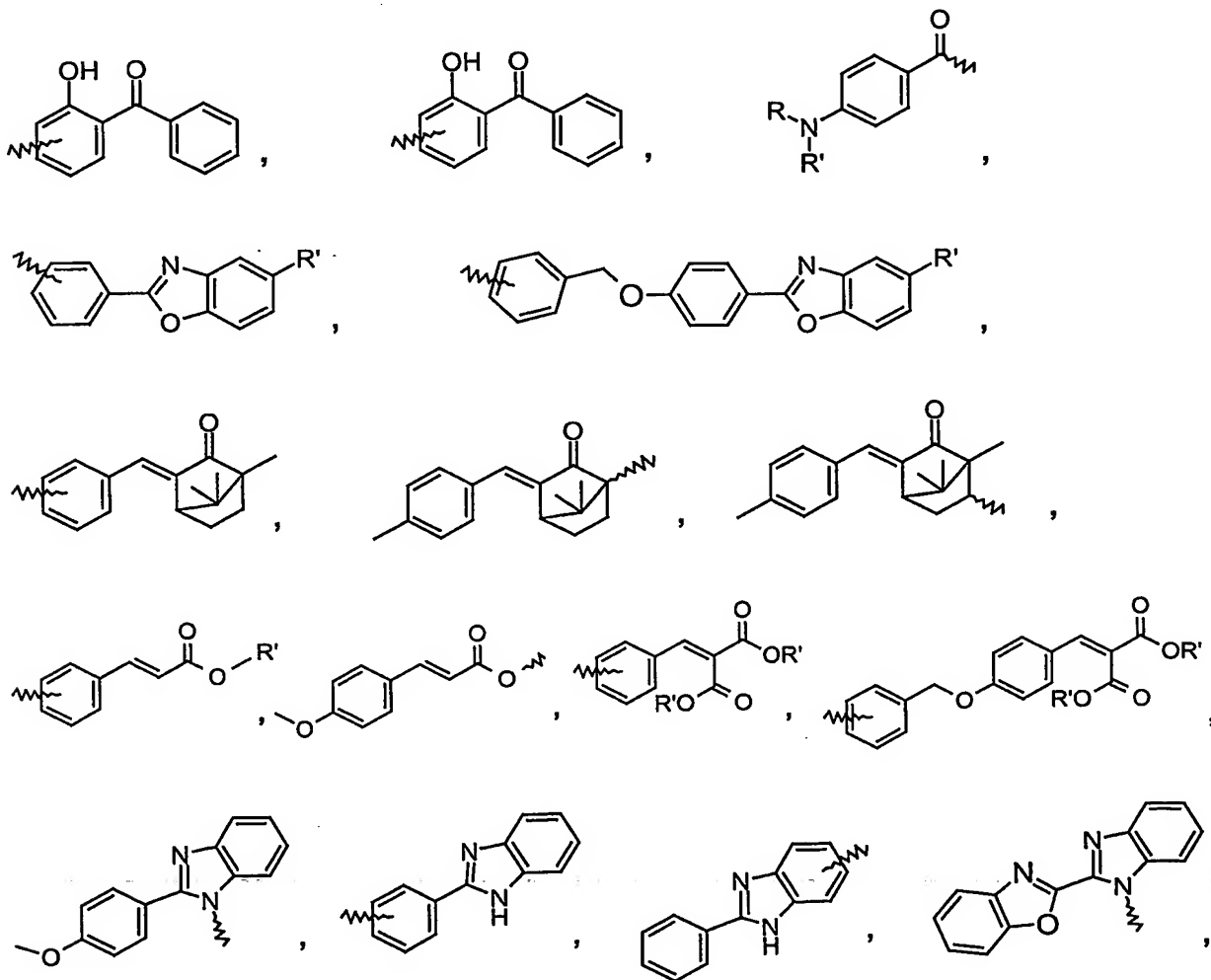
wherein

- A** is a chromophore with UV-A and/or UV-B filter activity and $-(B)_b(C)_c(D)_d(E)_e-$ is a spacer group in which
- B** is a linear or branched alkylene group with up to 20 carbon atoms
- C** is O, S or NH
- D** is a CONH- group
- E** is a linear or branched alkylene or alkenylene group with up to 20 carbon atoms and
- b** is 0 or 1,
- c** is 0 or 1,
- d** is 0 or 1 and
- e** is 0 or 1.

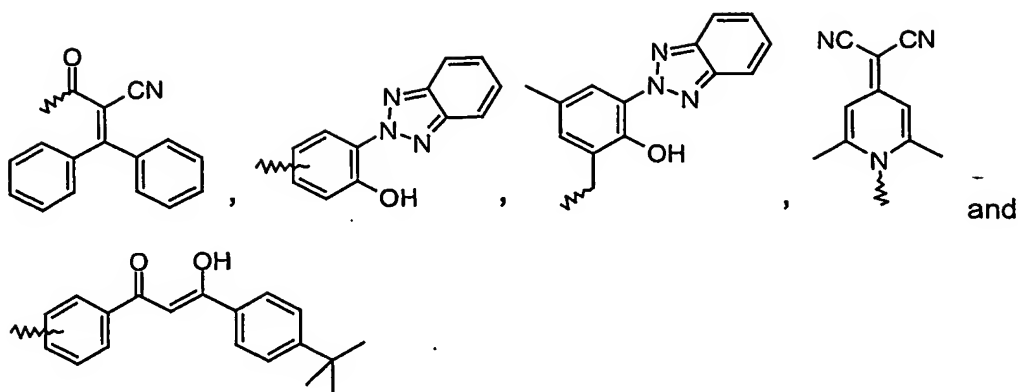
16. Crosslinkable chromophore according to claim 15, wherein the metallic or semi-metallic element **M** is silicon.

17. Crosslinkable chromophore according to claim 15 or 16, wherein moiety A is a chromophore selected from the group consisting of acrylates, p-aminobenzoates, camphor derivatives, cinnamates, benzophenones, esters of benzalmalonic acid, esters of 2-(4-ethoxy anilinomethylene)propandioic, imidazole derivatives, salicylates, triazone derivatives, triazol derivatives, dibenzoylmethanes, amino substituted hydroxybenzophenones, phenyl-benzimidazoles, anthranilates, phenyl-benzoxazoles and 1,4-dihydropyranes.

18. Crosslinkable chromophore according to claim 15, wherein moiety A is selected from the group consisting of



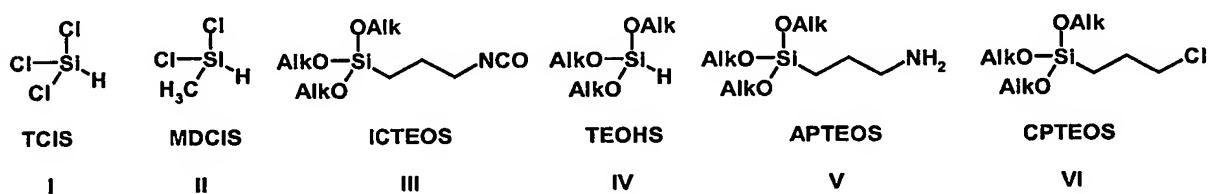
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wherein R' is hydrogen, hydroxy, straight or branched chain C₁₋₂₀-alkyl, -alkoxy or C₂₋₂₀-alkenyl.

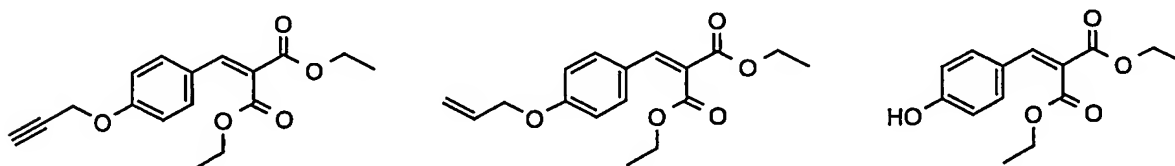
19. Crosslinkable chromophore according to claims 15 to 18, obtainable by reaction of a silene of the formula Si(R)_r(Q)_qS, wherein R and Q are as defined in any of claims 15 to 18, S is a hydrogen atom, a -(CH₂)_o-NCO group or a -(CH₂)_o-NH₂ group, r is 2 or 3, q is 0 or 1 and o is 1 to 6 with a chromophore with UV-A, UV-B and/or UV-C filter activity.

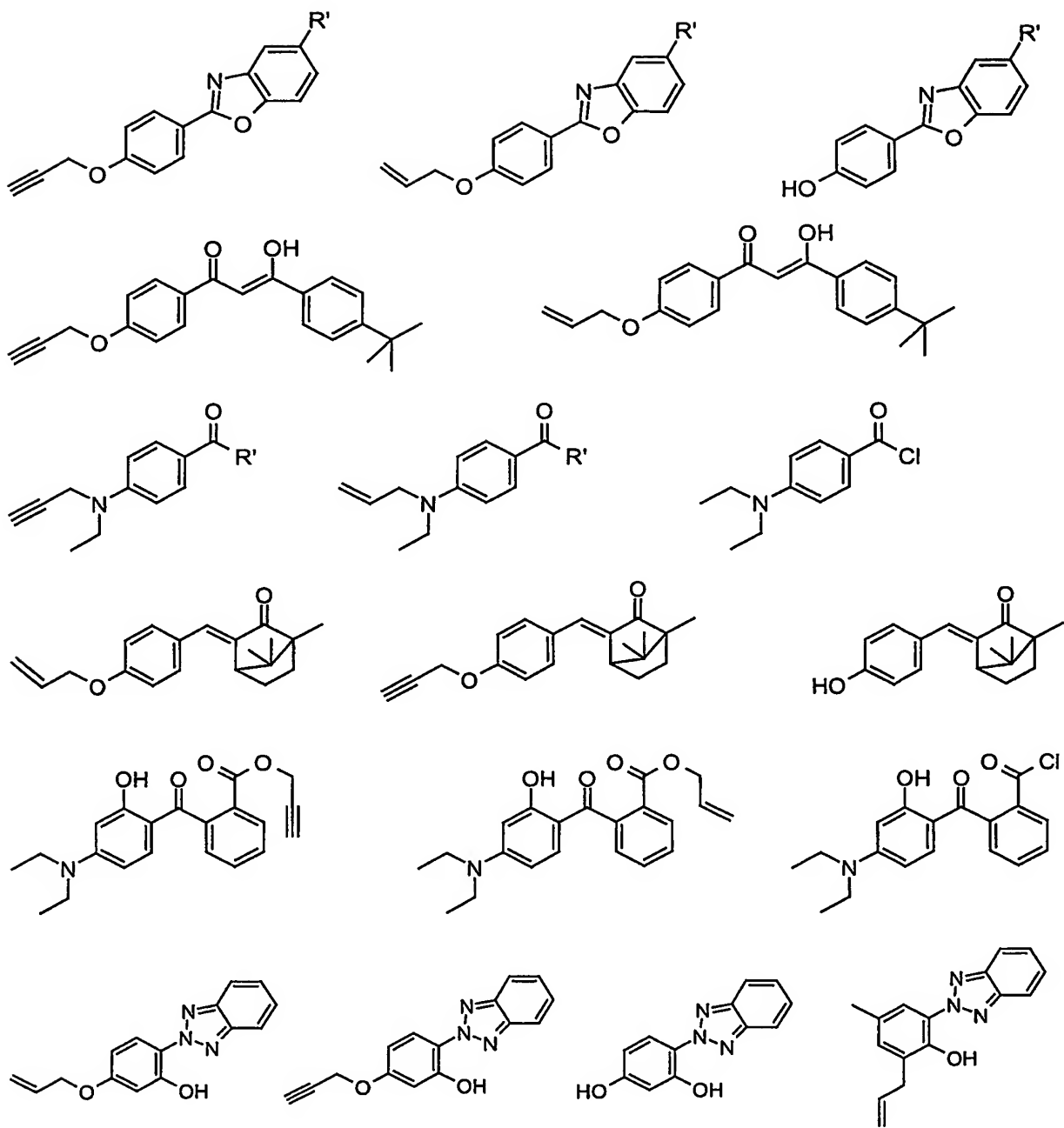
20. Crosslinkable chromophore according to claim 19, wherein the silane is selected from the group consisting of



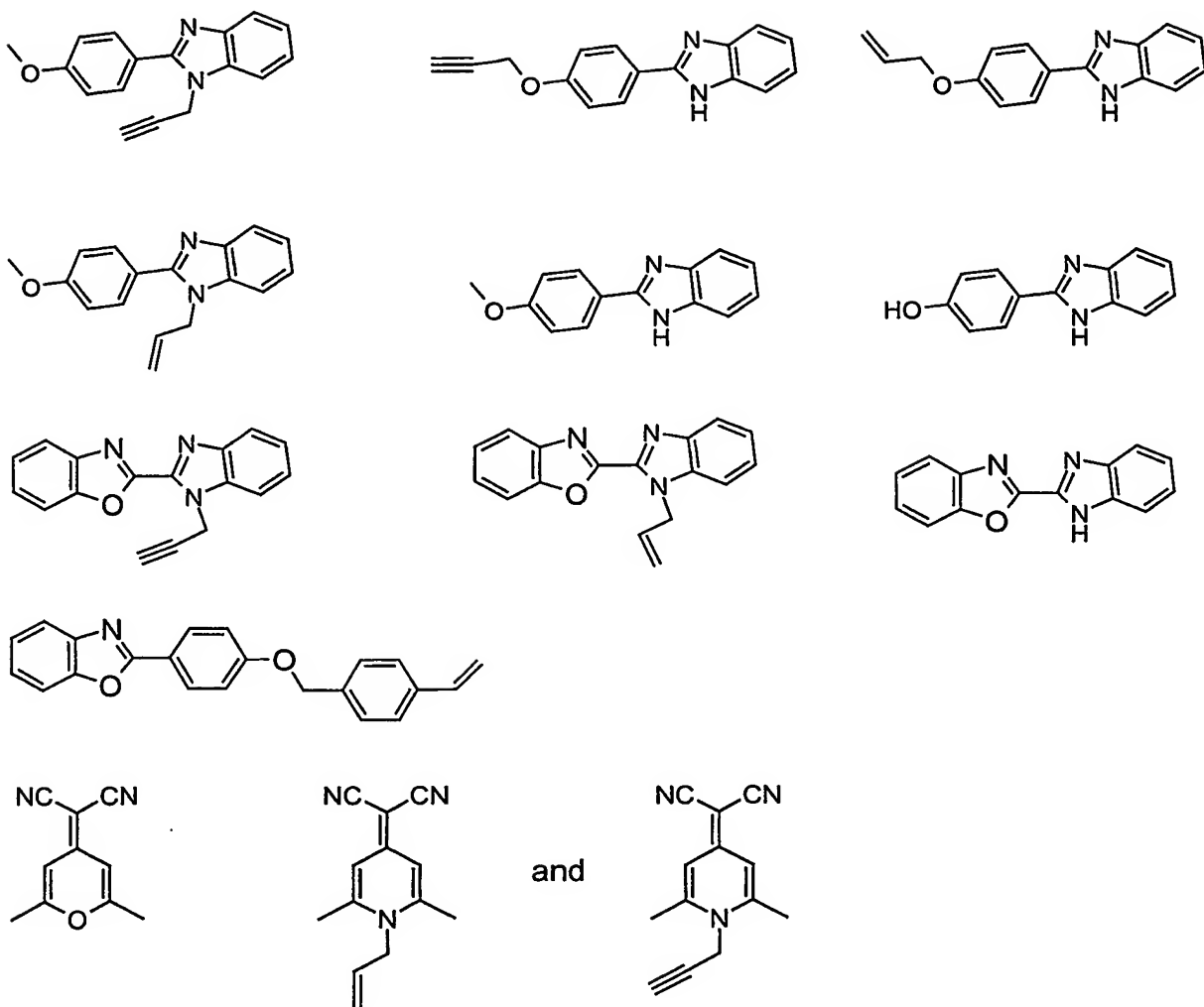
wherein Alk is a C₁-C₆ alkyl group.

21. Crosslinkable chromophore according to claim 19 or 20, wherein the chromophore with UV-A, UV-B and/or UV-C filter activity is selected from the group consisting of



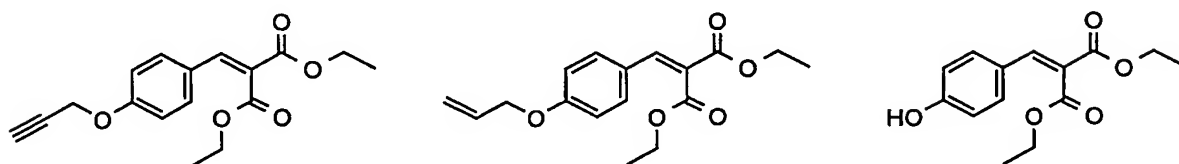


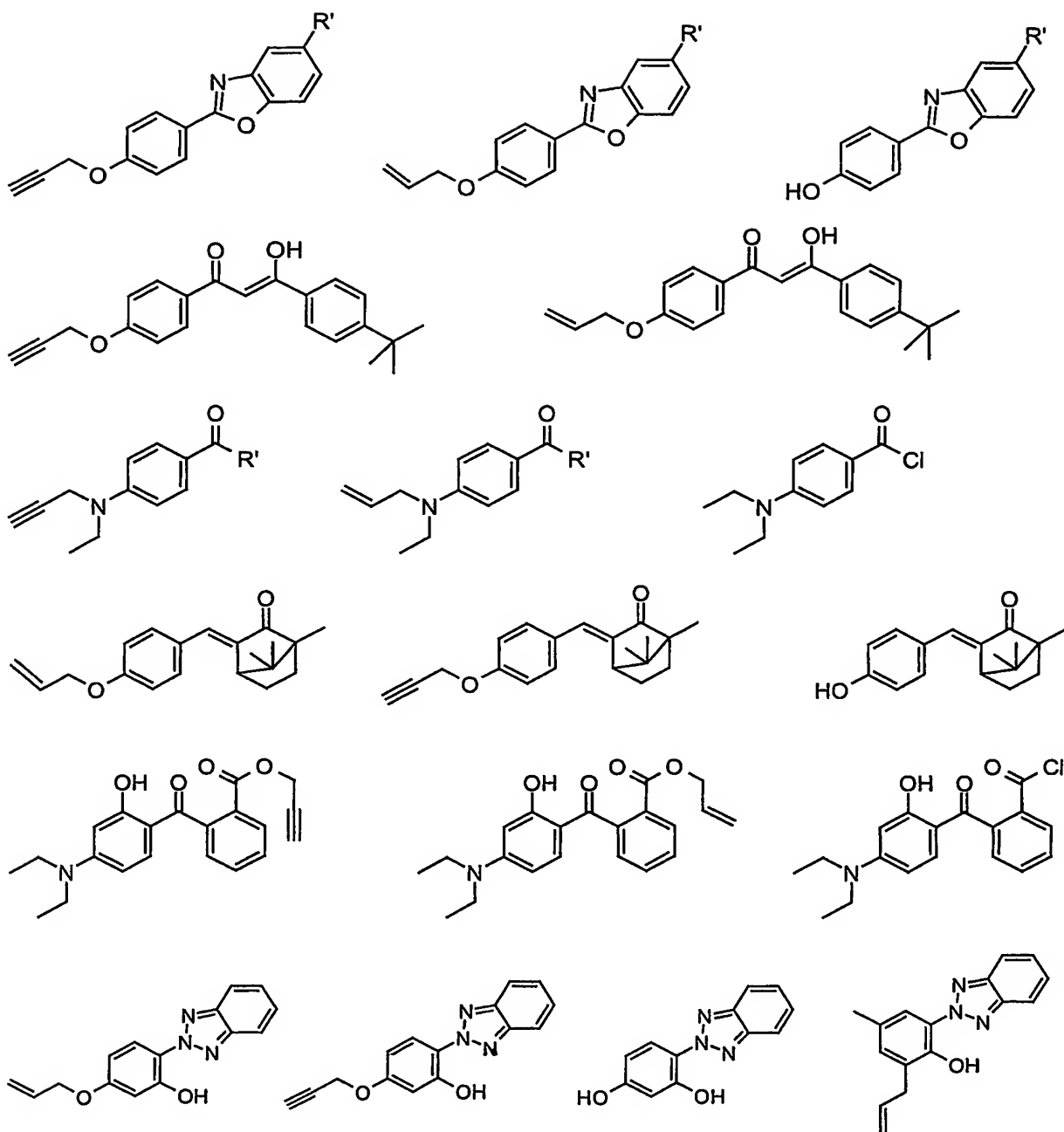
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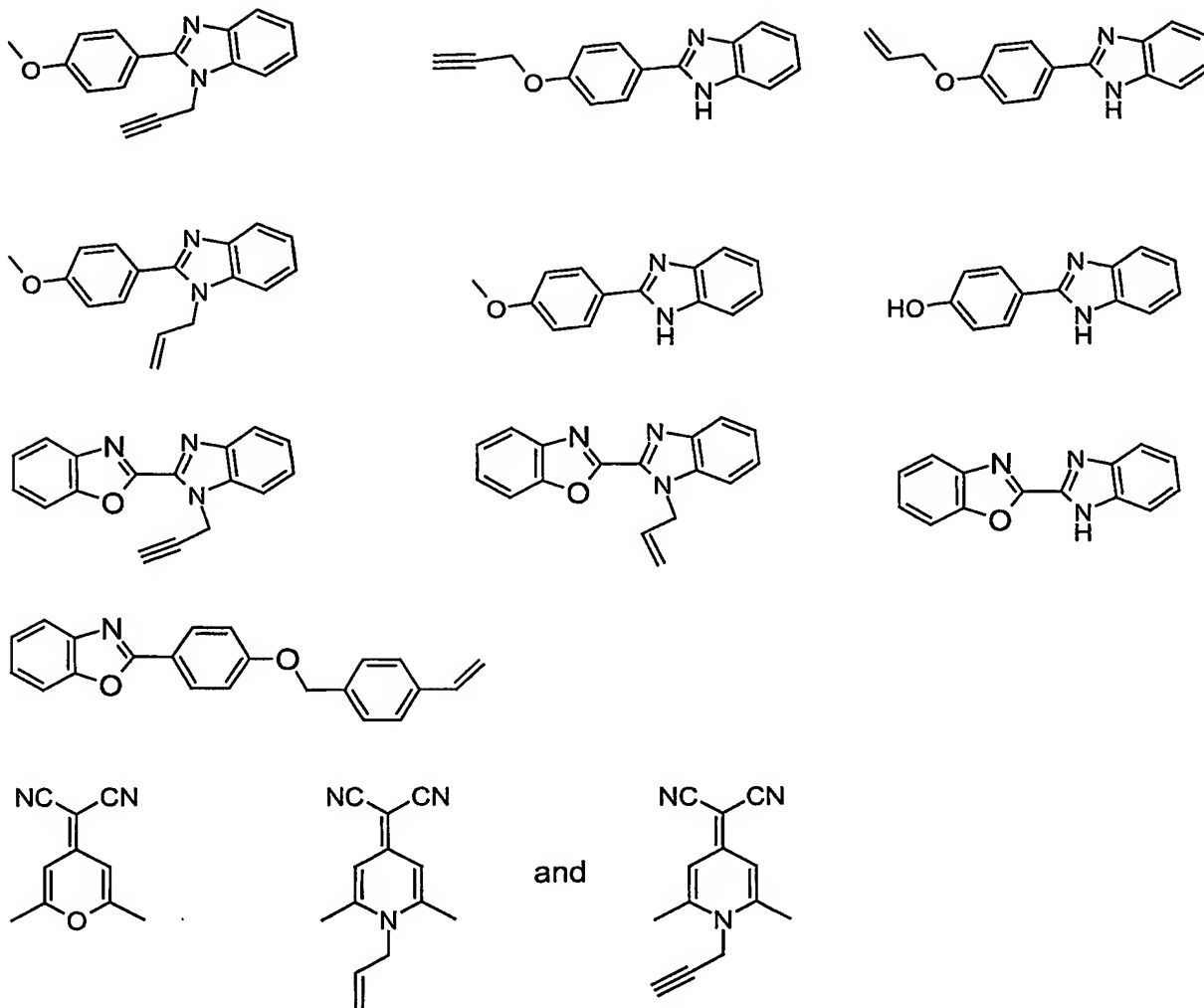
wherein R' is hydrogen, hydroxy, straight or branched chain C₁₋₂₀-alkyl, -alkoxy or C₂₋₂₀-alkenyl.

22. Chromophore selected from the group consisting of





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wherein R' is hydrogen, hydroxy, straight or branched chain C₁₋₂₀-alkyl, -alkoxy or C₂₋₂₀-alkenyl.

23. Process for producing a crosslinkable monomer as defined in any of claims 15 to 21 comprising the step of reacting a silane molecule with a chromophore.

24. Process for producing a crosslinkable monomer according to claim 23, wherein the silane molecule is as defined in claim 19 or 20.

25. Process for producing a crosslinkable monomer as defined in claim 23 or claim 24, wherein the chromophore is as defined in claim 22.